

**UTILITY  
PATENT APPLICATION  
TRANSMITTAL**

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.

200054US2SRD

First Inventor or Application Identifier

Miwako DOI

Title

CUSTOMER NAVIGATION SYSTEM AND CUSTOMER NAVIGATION METHOD

**APPLICATION ELEMENTS**

See MPEP chapter 600 concerning utility patent application contents

ADDRESS TO:

Assistant Commissioner for Patent  
Box Patent Application  
Washington, DC 20231

1. ☒ Fee Transmittal Form (e.g. PTO/SB/17)  
(Submit an original and a duplicate for fee processing)

2. ☒ Specification

Total Sheets **37**

3. ☒ Drawing(s) (35 U.S.C. 113)

Total Sheets **10**  
(Formals)

4. ☒ Oath or Declaration

Total Pages **2**

- a. ☒ Newly executed (original)

- b. ☐ Copy from a prior application (37 C.F.R. §1.63(d))  
(for continuation / divisional w/ box 16 completed)

- i. ☐ DELETION OF INVENTOR(S)  
Signed statement attached deleting inventor(s) named in  
the prior application, see 37 C.F.R. §1.63(d)(2) and  
1.33(b).

5. ☐ CD-ROM or CD-R in duplicate, large table or Computer  
Program (Appendix)

6. ☐ Nucleotide and/or Amino Acid Sequence Submission  
(if applicable, all necessary)

- a. ☐ Computer Readable Form (CRF)

- b. Specification or Sequence Listing on:

- i. ☐ CD-ROM or CD-R (2 copies); or

- ii. ☐ Paper

- c. ☐ Statements verifying identity of above copies

**ACCOMPANYING APPLICATION PARTS**

7. ☒ Assignment Papers (cover sheet & document(s))

8. ☐ Application Data Sheet. See 37 CFR 1.76

9. ☐ 37 C.F.R. §3.73(b) Statement ☐ Power of Attorney  
(when there is an assignee)

10. ☐ English Translation Document (if applicable)

11. ☐ Information Disclosure  
Statement (IDS)/PTO-1449 ☐ Copies of IDS  
Citations

12. ☐ Preliminary Amendment

13. ☒ White Advance Serial No. Postcard

14. ☒ Certified Copy of Priority Document(1)  
(if foreign priority is claimed)

15. ☐ Applicant claims small entity status.  
See 37 CFR 1.27

16. ☒ Other: Notice of Priority

16. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application no.:

Prior application information: Examiner:

Group Art Unit:

For CONTINUATION OR DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 4b, is considered a part of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

17. Amend the specification by inserting before the first line the sentence:

☐ This application is a ☐ Continuation ☐ Division ☐ Continuation-in-part (CIP)  
of application Serial No. Filed on

☐ This application claims priority of provisional application Serial No. Filed

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

INVENTOR(S) Miwako DOI

SERIAL NO: New Application

FILING DATE: Herewith

FOR: CUSTOMER NAVIGATION SYSTEM AND CUSTOMER NAVIGATION METHOD

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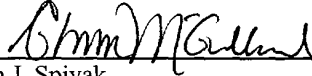
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TOTAL CLAIMS	16 - 20 =	0	× \$18 =	\$0.00
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TOTAL OF ABOVE CALCULATIONS				\$1,110.00
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Respectfully Submitted,

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TITLE OF THE INVENTION

CUSTOMER NAVIGATION SYSTEM AND CUSTOMER NAVIGATION  
METHOD

CROSS-REFERENCE TO RELATED APPLICATIONS

5           This application is based upon and claims the  
benefit of priority from the prior Japanese Patent  
Application No. 11-331972 filed November 22, 1999, the  
entire contents of which are incorporated herein by  
reference.

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BACKGROUND OF THE INVENTION

          There have been opened in recent years multiple  
large-scale attraction facilities such as theme parks,  
aquariums and museums. Such large-scale attraction  
facilities have a wide site area dotted with  
15       attractions and the like, and the attendant also  
reaches an enormous number. Therefore, relative to a  
small-scale amusement park or such, there is observed  
an unavoidable imperfection in quality of customer  
services, for example, with tendencies, such as for a  
20       guidance to be incomprehensive with mere usual  
announcements, hardly to be familiar, for movements  
between attractions to be time-consuming, and for a  
particular attraction and eating places there-around to  
be crowded with customers.

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          If a particular attraction or an eating place is  
crowded with customers, it is necessary to post there  
many employees to meet needs of the customers, in

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addition to a necessary device for customers to be kept  
from being bored during their waiting times. In some  
theme parks, while queuing, there is projected a  
picture such as a video picture relating to the attrac-  
tion, as a trial to thereby consume time, which however  
5 is nonsense for those having already watched the video  
or those finding no interest therein and does not  
constitute an effective way of passing a waiting time.

If customers crowd in eating places near a  
10 particular popular attraction, eating places drawing  
few customers are unable to average the condition of  
use of foodstuffs and other resources, as a problem.  
Usual eating places are fixed in location, and it is  
impossible to dynamically reallocate eating places  
15 where customers are crowd. The reallocation of eating  
shops, if made, should be a reallocation following  
customers having crowded, and unable to timely cope  
with the crowd of customers.

In theme parks or the like, it takes time to move  
20 between attractions, and when a customer goes to an  
attraction not crowded, if customers reconciled at  
other crowded attractions as well as those having  
enjoyed crowded attractions move in the same timing,  
then the destined attraction is to be crowded,  
25 rendering meaningless an intention the customer had to  
avoid a crowded attraction.

Such as when moving between attractions, taking

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time, or while waiting in a long queue at a crowded attraction, bored young children tend to depart from their parents, getting lost, as a problem.

Large-scale attraction facilities such as a theme park allow enjoyment of diverse kinds of attractions, eating, etc., but are problematic in services such as for the use to be comprehensive, or in a waiting time elongated by crowd, or to avoid a crowd, as described above.

#### BRIEF SUMMARY OF THE INVENTION

An object of the invention is to provide a customer navigation system and a customer navigation method for providing a high-quality service to an entering customer such as at a large-scale attraction facility.

To solve the problems, the invention is characterized in that a customer entering a facility is made to carry a customer navigation terminal communicable with outside by a short-range radio, and a customer navigation is performed through the terminal.

More specifically, according to the invention, a customer entering a facility is made to carry a customer navigation terminal having a memory function of information relating to the customer and a communication function with outside, and when the customer navigation terminal has come near a customer guide server installed at a particular point in the

facility, a customer navigation is performed by a communication between the customer navigation terminal and the customer guide server.

According to an aspect, the customer navigation terminal has an identification information memory configured to store identification information of the customer (for example, a nickname stated by the customer) carrying the terminal, the customer guide server has a caller configured to call the identification information stored in the identification information memory, and at least one of the customer guide server and the customer navigation terminal has a voice synthesizer configured to synthesize the identification information called by the caller as a voice.

It is enabled by the arrangement to provide a high-quality service to a customer entering a facility such as a theme park.

According to another aspect, the customer navigation terminal has a use data memory configured to store use data relating to a facility use of the customer in the facility, and the customer navigation system has a use data collecting device for recovering the customer navigation terminal to collect the use data stored in the use data memory. The use data memory stores, as the use data, e.g. data on a limit amount of use, a charge on use, a balance and a time of

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use of the customer in the facility.

It is enabled by the arrangement to acquire various use data relating to a facility use of the customer with ease without troubling the customer, permitting a quantitative improvement for efficient operation in accordance with the customer's desire.

Further, the invention is characterized by making a customer entering a facility carry a customer navigation terminal having an acquisition function of positional information of the customer in the facility and a communication function with outside, transmitting the positional information to a service server directly or indirectly communicating with the customer navigation terminal, having the service server respond to the positional information transmitted from the customer navigation terminal by planning a customer navigation method to generate customer navigation information in accordance with the customer navigation method, and transmitting the generated customer navigation information to the customer navigation terminal.

In other words, another customer navigation system according to the invention comprises a customer navigation terminal to be carried by a customer entering a facility and having a memory function of information relating to the customer and a communication function with outside, and a service

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server directly or indirectly communicating with the customer navigation terminal, the customer navigation terminal having a positional information acquiring unit configured to acquire positional information of the customer in the facility, a display unit configured to display the positional information on a map and facility information relating to an individual facility of the facility, and a first transmitter configured to transmit the positional information to the service server, and the service server having a navigation planning unit configured to respond to the positional information transmitted from the customer navigation terminal by planning a customer navigation method to generate customer navigation information in accordance with the customer navigation method, and a second transmitter configured to transmit the customer navigation information to the customer navigation terminal.

It is enabled by the arrangement to have improved services to the customer, such as by introducing thereto an non-crowded attraction, informing an attraction to take a reservation, or opening a stall in a crowded place, and concurrently for the facility side to average an operation ratio of resources, aiming at a great increase of sales.

The service server may have a section for dynamically setting a use price of the individual



facility or a sales price of a particular article in the individual facility in accordance with the customer navigation method, and the navigation planning unit may reflect the set use price or sales price on the customer navigation information.

Like this, a navigation method planned on a basis of positional information or such can be followed to dynamically change, for example, a use price of an individual facility such as for an attraction in a theme park, or a sales price of a particular article in a shopping mall, thereby permitting an effective calling of customer, allowing for customer services to be improved, as well as for resources in the facility to be effectively utilized.

A customer navigation terminal according to the invention is to be carried by a customer entering a facility, and comprises an identification information memory configured to store identification information of the customer, and a transceiver configured to receive a call signal inputted from outside and to transmit outside the identification information read from the identification information memory.

Another customer navigation terminal according to the invention comprises a use data memory configured to store use data relating to a facility use of a customer including data on a limit amount of use, a charge on use, a balance and a time of use of the customer in a

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5           Another customer navigation terminal according to the invention comprises a positional information acquisition unit configured to acquire positional information of a customer in a facility, a display unit configured to display the positional information on a map and facility information relating to an individual facility of the facility, and a transmitter configured to transmit the positional information outside.

According to the invention, a customer entering a facility is let to carry a customer navigation terminal capable of communication with outside by a short-range radio, and a customer navigation is performed through the terminal, thereby implementing a system that allows in a large-scale facility such as a theme park or shopping mall for an entering customer to be provided with high-quality services, and for the facility side as well to aim at a smooth and efficient operation.

Additional objects and advantages of the invention will be set forth in the description which follows, and in part will be obvious from the description, or may be learned by practice of the invention. The objects and advantages of the invention may be realized and obtained by means of the instrumentalities and

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an attraction using age and a frequency of use as a result of collection by a use data collector in the embodiment.

FIG. 9 is a diagram showing a relationship between attraction types and a waiting time as another result of collection by the use data collector in the embodiment.

FIG. 10 is a block diagram showing an arrangement of a customer navigation system according to a third embodiment of the invention.

FIG. 11 is an illustration for describing examples of concrete actions in the embodiment.

FIG. 12 is an illustration showing an example of display on a customer navigation terminal in the embodiment.

FIG. 13 is a block diagram showing an arrangement of a customer navigation system according to a fourth embodiment of the invention.

FIG. 14 is a diagram showing an example of an expectation function used in a dynamic price setter in the embodiment.

FIG. 15 is an illustration for describing examples of concrete actions in the embodiment.

#### DETAILED DESCRIPTION OF THE INVENTION

The embodiments of the invention will be described below with reference to the drawings.

(First embodiment)

FIG. 1 shows a schematic arrangement of a customer navigation system according to the first embodiment of the invention. This customer navigation system is constituted roughly with a customer navigation terminal 1A to be carried by a customer, and a customer guide server 2A installed in a facility such as a theme park. Hereinafter, for a simplified description, the facility to which a customer navigation system is applied is assumed as a theme park.

The customer navigation terminal 1A has a function such as of a kind of prepaid card or one-day ticket usable such as at a attraction or eating place in the theme park and a communication function limited to be communicative within the theme park, and is configured, as a thin film such as a seal with printed circuit components, to be adhesive, such as by a magic tape such as to the user's cloth, and to be attached without burden to the user, as illustrated in FIG. 2. The customer navigation terminal 1A in FIG. 2 is rectangular in configuration, but not limited to the configuration.

The customer navigation terminal 1A is made by a nickname memory 11 like a memory card as an identification information memory for mainly storing identification information (to be called a nickname) identifiable as an own provisional name of the customer

itself, with the customer's anonymity kept, a transmitter-receiver 12 for communications to be made by a short-range radio, such as a Bluetooth, with a device authenticated in advance, such as at an attraction or charge collector installed in the theme park, and an information manager 13 for information management between the nickname memory 11 and the transmitter-receiver 12. The information manager 13 may have output functions, such as for a voice output or image display, as necessary.

The nickname memory 11 is adapted, as shown in FIG. 4A to FIG. 4C, to memorize the customer's nickname and, besides, parameters, such as the height and age, that do not invade the person's privacy, but are necessary for use, such as of an attraction. Those contents of memory are written by input operations such as of the nickname, such as by use of a voice or menu selection, upon purchase of an entrance ticket (with a rental of a customer navigation terminal 1 inclusive) when entering the theme park.

The customer guide server 2A is installed at such particular points as attractions or charge collecting devices in the theme park or as base stations scattered in the theme park, and gives the customer necessary navigation information by outputting in voice the nickname stored in the nickname memory 11 of the customer navigation terminal 1A carried by the customer.

A speaker for the audio output may be installed in the customer guide server 2A, or may be by use of a PA speaker in the theme park.

More specifically, the customer guide server 2A is  
5 made by a caller 21 (to be constituted with a speaker  
for example) for calling, from the customer navigation  
terminal 1A, the nickname stored in the nickname memory  
11, a voice synthesizer 22 for synthesizing as a voice  
the nickname called by the caller 21, a transmitter-  
10 receiver 23 for making communications by a short-range  
radio, such as a Bluetooth, with the transmitter-  
receiver 12 in the customer navigation terminal 1A, and  
an information manager 24 for performing a management  
of information among the caller 21, the voice  
15 synthesizer 22 and the transmitter-receiver 23.

Next, there will be described a processing  
procedure of the information manager 24 in the customer  
guide server 2 of FIG. 1, using the flowchart of FIG. 3.

First, the information manger 24 detects, via the  
20 transmitter-receiver 23, for a customer navigation  
terminal 1A waiting in order in a vicinity of the  
customer guide server 2A, and if any present there,  
acquires a proper ID the customer navigation terminal  
1A has (step S101), and checks if its balance is  
25 sufficient for use at an attraction or eating place  
where the customer guide server 2A is installed (step  
S102). The detection for the customer navigation

terminal is made to detect the position, for example, by a decision as to which one of a plurality of Bluetooth base stations has received a communication from the customer navigation terminal.

5           Unless a necessary balance is left, the information manger 24 transmits the effect of a short balance from the transmitter-receiver 23 to the transmitter-receiver 12 of the customer navigation terminal 1A, notifying a user of the customer  
10           navigation terminal 1A (step S103). At this time, for a protection of the user's privacy, there is transmitted a message of the short balance in a text without using a voice. The user can confirm the text message through an unshown output device, such as a  
15           liquid crystal display, provided for the customer navigation terminal 1A.

          On the other hand, if a necessary balance is left at the step S102, the information manager 24 acquires a nickname from the nickname memory 11, via the  
20           transmitter-receiver 12 and the transmitter-receiver 23 (step S104). The acquired nickname is converted by the voice synthesizer 22 into a synthesized voice, together with a message informing that an attraction or eating shop where the customer guide server 2A is installed  
25           can be used (step S105). Then, a charge is collected (step S106), and the flow again goes to the step S101, repeating like process.



At the step S105, if the nickname is "Pokekun No. 1" for example, there is generated a synthesized voice such that "Mr. Pokekun No. 1, thank you for your use". The synthesized voice is output from a speaker  
5 installed in the customer guide server 2A or from a PA service in the theme park, or is transmitted, through the information manager 24, from the transmitter 23 to the customer navigation terminal 1A, where it is output, through transmitter-receiver 12 and the information  
10 manager 13, from an not-shown small speaker provided for the customer navigation terminal 1A. Although the voice synthesizer 22 is provided on the customer guide server 2A side in this embodiment, a voice synthesizer may be provided on the customer navigation terminal 1A  
15 side.

In regard of the synthesized voice, conversions can be made with ease, for example, such that the pitch is varied in accordance with a parameter stored in the nickname memory 11, or that the voice quality is  
20 changed to that of a character the customer likes. If the synthesized voice is designated to be a "voice of Pokekun" as shown in FIG. 4B, it is possible to give a nickname or message in the voice of Pokekun as a character. What kind of voice can be used is  
25 associated with the issue of copy right, and is selected from kinds of voices prepared in advance when entering the theme park. At the theme park end, it

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According to this embodiment, though in terms of a

nickname having a anonymity, a customer is called in guidance by own name, and can carefully hear a message, such as a caution to use of an attraction. At the theme park end, there can be achieved a higher  
5 propaganda effect than usual, by making the customer listen to a commercial or the like when having called the customer by the nickname, arousing the attention.

Moreover, services can be provided with an increased intimacy from small children to advanced ages.

10 Further, when a child gets lost, a guardian ID stored in the nickname memory 11 can be utilized as well to inform the guardian of the effect, permitting a smooth operation such as of a theme park or shopping mall.

15 Like this, according to the embodiment, a customer entering a facility such as a theme park can receive a higher quality of service than in the past, allowing the facility side also to have various advantages such as an improved propaganda effect and smooth operation.

20 (Second Embodiment)

FIG. 5 shows a schematic arrangement of a customer navigation system according to a second embodiment of the invention. The customer navigation system is constituted with a customer navigation terminal 1B, a  
25 customer guide server 2B, and a use data collector 3.

The customer navigation terminal 1B has, besides a transmitter-receiver 12 and an information manager 13,

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a use data memory 14 for storing use data relating to a facility use of a customer in a facility such as a theme park or shopping mall, and more specifically, a limit charge for use, a charge for use, a time of use, a balance, etc. The use data memory 14 is a card-like medium mounted as a small memory chip of a stamp size employable such as for music distribution for example, and detachably attached to the customer navigation terminal 1B.

10           The transmitter-receiver 12 makes transmission to and reception from a component having an established authentication, such as a charge collector installed in the facility, as described, and the information manager 13 manages use data such as of charge collection by the transmitter-receiver 12, managing a writing and calling of use data at the use data memory 14.

          The customer guide server 2B has a charge collector 25 for collecting a charge from the customer navigation terminal 1B, via a transmitter-receiver 23.

20           The transmitter-receiver 23 is for communication with the customer navigation terminal 1B, and an information manager 24 performs an information management between the transmitter-receiver 23 and the charge collector 25.

          The use data collector 3 is installed in adequate places such as an attraction or a vicinity of an exit of the theme park for example, for recovering a customer navigation terminal 1B after use of a customer,

and collects use data stored in the use data memory 14.  
The use data memory 14, which is of a card-like medium  
(smart medium) for example and detachably attachable to  
the customer navigation terminal 1B, as described, is  
5 removed from the customer navigation terminal 1B upon  
the recovery, and inserted into the use data collector  
3, so that the use data stored in the use data  
collector 14 can be read to be collected.

As the customer navigation terminal 1B itself has  
10 a card-like or seal-like thin configuration, the  
customer navigation terminal 1B may be inserted as it  
is, into the use data collector 3, so that use data  
stored in the use data memory 14 can be read to be  
collected, and the customer navigation terminal 1B can  
15 be recovered. Further, the transmitter-receiver 12 of  
the customer navigation terminal 1B may be used for  
collecting by radio the use data stored in the use data  
memory 14.

There will be described a processing procedure of  
20 the use data collector 3, using the flowchart of FIG. 6.

First, it is checked if the use data memory 14 is  
in a readable state (step S201), and unless it is  
readable, the effect is displayed (step S204). If the  
use data memory 14 is readable, use data stored therein  
25 are read (step S202), and the stored use data are  
cleared (step S203).

In the use data memory 14 are stored, for example,

a type of attraction used and a time of use as shown in FIG. 7A. As another example, the data of use time may be separated into a use start time and an end time, to be stored as shown in FIG. 7B, or a waiting start time, i.e., the time when a waiting is started may be added to be stored as shown in FIG. 7C. There are concurrently shown in FIG. 7A to FIG. 7C the contents of a nickname memory 11 described in the first embodiment.

The use data collector 3 performs a variety of summations based on collected use data, reflecting the results on services such as in a theme park. More specifically, the use data collector 3 sums use frequencies of attractions by customer ages as shown in FIG. 8 for example. FIG. 8 is an example of an attraction A, while like summations of use frequencies are made of other attractions B, C, ..., as well. Moreover, waiting times are summed by attraction types A, B, C, ..., respectively, as shown in FIG. 9 for example. Further, though not illustrated, the use data collector 3 may perform summations such as of a customer crowdedness at each attraction, an interval between from the use start time to the end time, or an interval as the interval between use start time and end time minus an actual time.

Assuming the attraction A be designed for a generation of twenties as its target, a summation of FIG. 8 shows a result as designed, proving the design

to be correct. On the contrary, if the attraction A be  
designed for a generation of teens as the target, the  
design is somewhat different, and a cause of the  
deviation in design may be found such as by comparison  
5 with another attraction popular to the teens'  
generation. Further, a summation result of FIG. 9 may  
be used, for example, for analysis to determine what  
type of attraction has an abnormally long waiting time  
of 50 minutes or more, and to take a measure for the  
10 waiting time to be shorter.

Further, a time zone high of use frequency can be  
seen by every attraction, and such as by disposing a  
stall for selling light meals such as pop corn and hot  
dog in the time zone, there can be made a reflection of  
15 summation result so as to permit an improved customer  
service and an increased sales such as of an eating  
place to be concurrently achieved.

Like this, according to the embodiment, various  
use data relating to a facility use of a customer can  
20 be obtained with ease without troubling the customer,  
permitting an improvement for efficient operation to be  
quantitatively performed in accordance with customer's  
desire.

(Third embodiment)

25 FIG. 10 is a diagram showing an arrangement of a  
customer navigation system according to a third  
embodiment of the invention. The customer navigation

system is constituted with a customer navigation terminal 1C and a service server 4A.

5 The customer navigation terminal 1C has, besides the arrangement of the second embodiment shown in FIG. 5, a facility information memory 15 for storing a map of a facility such as a theme park or shopping mall and facility information relating to individual facilities (attractions, sales shops, etc.), and a positional information acquirer 16 for acquiring  
10 positional (current place) information of a customer in the facility. The positional information acquirer 16 acquires the position in dependence on which Bluetooth base station has received a communication from the customer navigation terminal 1C.

15 On the other hand, the service server 4A is made by a transmitter-receiver 41 for directly or indirectly communicating with the customer navigation terminal 1C, and a navigation planner 42 for responding to customer positional information received from the customer  
20 navigation terminal 1C, via the transmitter-receiver 41, to plan a customer navigation method. The service server 4 transmits customer navigation information in accordance with the navigation method planned by the navigation planner, from the transmitter-receiver 41 to  
25 the customer navigation terminal 1C, to thereby make a customer navigation such as in correspondence to a crowded condition.



Next, there will be given concrete description of examples of actions in the embodiment, by using FIG. 11.

A customer a (advanced age) and a customer b (infant) have their customer navigation terminals 1C.

5 Each customer navigation terminal 1C recognizes a current position of the customer by communication with a repeater through the positional information acquirer 16, such as by use of a short-range radio such as a Bluetooth. The positional information indicating the  
10 current position is transmitted, from the transmitter-receiver 12 through a not-shown repeater to the service server 4A, where it is received by the transmitter-receiver 41 and sent to the navigation planner 42.

The navigation planner 42 collects positional  
15 information thus sent from respective customer navigation terminals 1C, indicating the positional information, for example, as black dots on a map prescribed in a lower region of FIG. 11. The navigation planner 42 plans a navigation method on  
20 bases of a crowd condition recognized from the positional information and of contents of use data sent from use data memories 14 of the customer navigation terminals 1C via like paths to the positional information, and generates customer navigation  
25 information in accordance with the navigation method. The navigation planner 42 may for example perform a calculation using an optimization algorithm, such as a

linear programming. More specifically, it may for example prepare a function from a crowd condition at each attraction, a waiting queue of customer waiting the attraction, and parameters such as necessary times for the customer waiting the attraction to move to other attractions, giving weights to the parameters, varying the parameters so that the function takes a maximum value.

The customer navigation information is transmitted from the transmitter-receiver 41 through a repeater (not shown) to the customer navigation terminal 1C, where it is received by the transmitter-receiver 12 and input to the information manager 13. The information manager 13 displays the input customer navigation information on a display (not shown) thereby perform a customer navigation. As the use data memory 14 has an age of the customer stored therein as shown in FIG. 7A, 7B or 7C, the customer navigation can be varied in dependence on the age as well as on the crowd condition.

For example, as an attraction A is crowded, the navigation planner 42 makes a plan to recommend other attractions to some of customer queuing at the attraction A that are selected in consideration of the age. For example, for customers selected from a view point of their ages, such navigation information is presented that "Attraction A is crowded. Attraction D (enjoyable for aged person) is not crowded, how is it?,

as shown in FIG. 11.

By presentation of such navigation information, a customer navigation terminal 1C the customer a carrying has a current position of the customer a and a position of the attraction D displayed on a map stored in the facility information memory 15 as shown in FIG. 12. Therefore, the customer a is allowed to decide, after confirmation of the display, whether to move to the attraction D in accordance with the navigation.

The navigation planner 42 may be configured not simply to plan a navigation method in view of a degree of crowd about a customer, but also to make such a navigation as to positively propagate held events. More specifically, if, for example, a popular attraction "Pokekun" to be held still has non-reserved seats, there are selected matching ages to the attraction from ages of customer stored in use data memories 14, and invitations are given.

For example, for a customer b who is infant, the navigation planner 42 notifies such navigation information that "At ..., attraction of Pokekun is starting. There are seats yet. Do you want reserve any?", through a customer navigation terminal 1C the customer b carrying. If the customer b or guardian thereof gives a consent to reserving seats in response to the navigation information, then a corresponding number of seats are reserved, enabling a navigation

from a current position to an attraction center as well as to the seats to be performed in accordance with contents of the facility information memory 15. The customer's consent to reserving seats can be given, for example, by selecting "YES" or "NO" buttons provided on the customer navigation terminal 1C.

The navigation planner 42 may prepare a plan such as for movement of a light meal shop, for example a stall for selling pop corn, to a crowded place in accordance with such a crowd condition as shown in FIG. 11.

Like this, according to the embodiment, there are given advantages to the customer, such that customer services can be improved such as by guiding a non-crowded attraction to the customer, by informing an attraction and taking a reservation, or by opening a stall in a crowded place, as well as to the facility side, such that sales can be greatly increased by averaging a running ratio of resources.

(Fourth embodiment)

FIG. 13 shows an arrangement of a customer navigation system according to the fourth embodiment of the invention. In this embodiment, a service server 4B has a dynamic price setter 43 in addition to the arrangement of the third embodiment shown in FIG. 10.

In the third embodiment, a customer navigation is made in accordance with a crowd state at an attraction,

age of customer, etc. It should however be noted that guiding a non-crowded attraction simply because of a crowd will not always cause customer to move as planned. That is, such a navigation does not always give a significant impact to the customer. To this point, the fourth embodiment employs the dynamic price setter 43 to perform more positive navigation such as by rendering cheaper than usual the use price (charge) of a non-crowded attraction.

The dynamic price setter 43 acquires, besides positional information acquired from a customer navigation terminal 1C for example, waiting time information by attractions, such as shown in FIG. 9, from a use data memory 14 of a customer navigation terminal 1. Based on the information acquired, the dynamic price setter 43 sets up an expectation function value, for example like the following, and dynamically sets a price to meet it.

Expectation function

$$= ((\text{normal price} - \text{set price}) / \text{normal price}) (\text{waiting time} - \alpha)^2$$

This expectation function is set so that the waiting time becomes 0 at an optimal  $\alpha$  (for example, 5 minutes). More specifically, the function has a steeper inclination, as a discount width increases, as shown in FIG. 14 for example. A price is dynamically set by such an expectation function, for position

invitation of customer, whereby resources such as attractions can have an increased operation efficiency.

In this case, the navigation information appeals a price discount, such that "Attraction D is half-priced, and not crowded, how is it?" or that "Attraction of  
5 Pokekun is starting. Price is now 10% discount. Do you want to reserve a seat?, as shown in FIG. 15 for example.

In the examples of actions described, a theme park  
10 is exemplified for description, which however does not constitute a limitation. For example, in a shopping mall, if it is desired to immediately sell out fresh foods such as raw fish and vegetables, there may be set an expectation function such as by using the number of  
15 neighboring customer in place of a waiting time as a parameter for price setting, thereby permitting a dynamic price setting.

Like this, according to the embodiment, there are effected dynamic variations such as of use prices of  
20 individual facilities such as attractions in a theme park or selling prices of particular articles in a shopping mall, in accordance with a navigation method planned on bases such as of positional information, allowing for customer to be effectively called up,  
25 permitting an improved customer service, as well as promotion of an effective utilization of resources in a facility.

While there have been described several  
embodiments of the invention, the invention is not  
limited to those embodiments, and arrangements of the  
first to the fourth embodiments may be adequately  
5 combined to be executed.

Additional advantages and modifications will  
readily occur to those skilled in the art. Therefore,  
the invention in its broader aspects is not limited to  
the specific details and representative embodiments  
10 shown and described herein. Accordingly, various  
modifications may be made without departing from the  
spirit or scope of the general inventive concept as  
defined by the appended claims and their equivalents.

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WHAT IS CLAIMED IS:

1. A customer navigation system comprising:  
a customer navigation terminal to be carried by a  
customer entering a facility, including:

5 a memory section configured to store information  
relating to the customer and

a communication section configured to make  
communication with a customer guide server; and

10 a customer guide server installed in the facility,  
including:

a communication section configured to make  
communication with the customer navigation terminal;  
and

15 an information management section configured to  
perform a customer navigation to the customer  
navigation terminal via the communication section of  
the customer guide server.

20 2. The system according to claim 1, wherein the  
customer navigation terminal includes an identification  
information memory configured to store identification  
information of the customer carrying the terminal,

the customer guide server includes a calling unit  
configured to call the identification information  
stored in the identification information memory, and

25 at least one of the customer guide server and the  
customer navigation terminal includes a voice  
synthesizer configured to synthesize the identification

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information called by the calling unit as a voice.

3. The system according to claim 1, wherein the customer navigation terminal includes a use data memory configured to store use data relating to a facility use of the customer in the facility, and

the customer navigation system includes a use data collector configured to recover the customer navigation terminal to collect the use data stored in the use data memory.

4. The system according to claim 2, wherein the customer navigation terminal includes a use data memory configured to store use data relating to a facility use of the customer in the facility, and

the customer navigation system includes a use data collecting device configured to recover the customer navigation terminal to collect the use data stored in the use data memory.

5. The system according to claim 3, wherein the use data memory stores data on a limit amount of use, a charge on use, a balance and a time of use of the customer in the facility, as the use data.

6. The system according to claim 4, wherein the use data memory stores data on a limit amount of use, a charge on use, a balance and a time of use of the customer in the facility, as the use data.

7. A customer navigation system comprising:  
a customer navigation terminal to be carried by a

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customer entering a facility, including:

a memory section configured to store information relating to the customer;

5 a communication section configured to make communication with a customer guide server;

a positional information acquiring unit configured to acquire positional information of the customer in the facility;

10 a display unit configured to display the positional information on a map and facility; and

a first transmission unit configured to transmit the positional information to a service server; and

15 a service server directly or indirectly communicating with the customer navigation terminal, including:

20 a navigation planning unit configured to respond to the positional information transmitted from the customer navigation terminal to generate customer navigation information in accordance with a customer navigation method; and

a second transmission unit configured to transmit the customer navigation information to the customer navigation terminal.

25 8. The system according to claim 7, wherein the service server includes a section configured to dynamically set a use price of the individual facility or a sales price of a particular article in the

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5           9. A customer navigation method comprising the  
steps of:

10

15

20

25

5           transmitting the positional information to a  
service server directly or indirectly communicating  
with the customer navigation terminal, including: a  
navigation planning unit configured to respond to the  
positional information transmitted from the customer  
10 navigation terminal to generate customer navigation  
information in accordance with a customer navigation  
method, and a second transmission unit configured to  
transmit the customer navigation method to the customer  
navigation terminal;

15           having the service server respond to the  
positional information transmitted from the customer  
navigation terminal to generate customer navigation  
information in accordance with the customer navigation  
method; and

20           transmitting the generated customer navigation  
information to the customer navigation terminal.

11. The method according to claim 10, wherein at the service server, in accordance with the customer navigation method, a use price of the individual facility or a sales price of a particular article in the individual facility are dynamically set, and the set use price or sales price are reflected on the



to an individual facility of the facility; and

a transmitter configured to transmit the positional information outside.

15. A service server for directly or indirectly  
5 communicating with a customer navigation terminal to be carried by a customer entering a facility and having a memory function of information relating to the customer and a communication function with outside, comprising:

10 a navigation planning unit configured to respond to positional information of the customer in the facility, transmitted from the customer navigation terminal, by planning a customer navigation method to generate customer navigation information in accordance with the customer navigation method; and

15 a transmission unit configured to transmit the customer navigation information to the customer navigation terminal.

16. The service server according to claim 15, further comprising a dynamic price setting unit  
20 configured to respond to waiting time information by attractions acquired from the customer navigation terminal to dynamically set a price meeting an expectation function =  $((\text{normal price} - \text{set price}) / \text{normal price}) (\text{waiting time} - \alpha)^2$ , where  $\alpha$  is an  
25 optimal waiting time.

—

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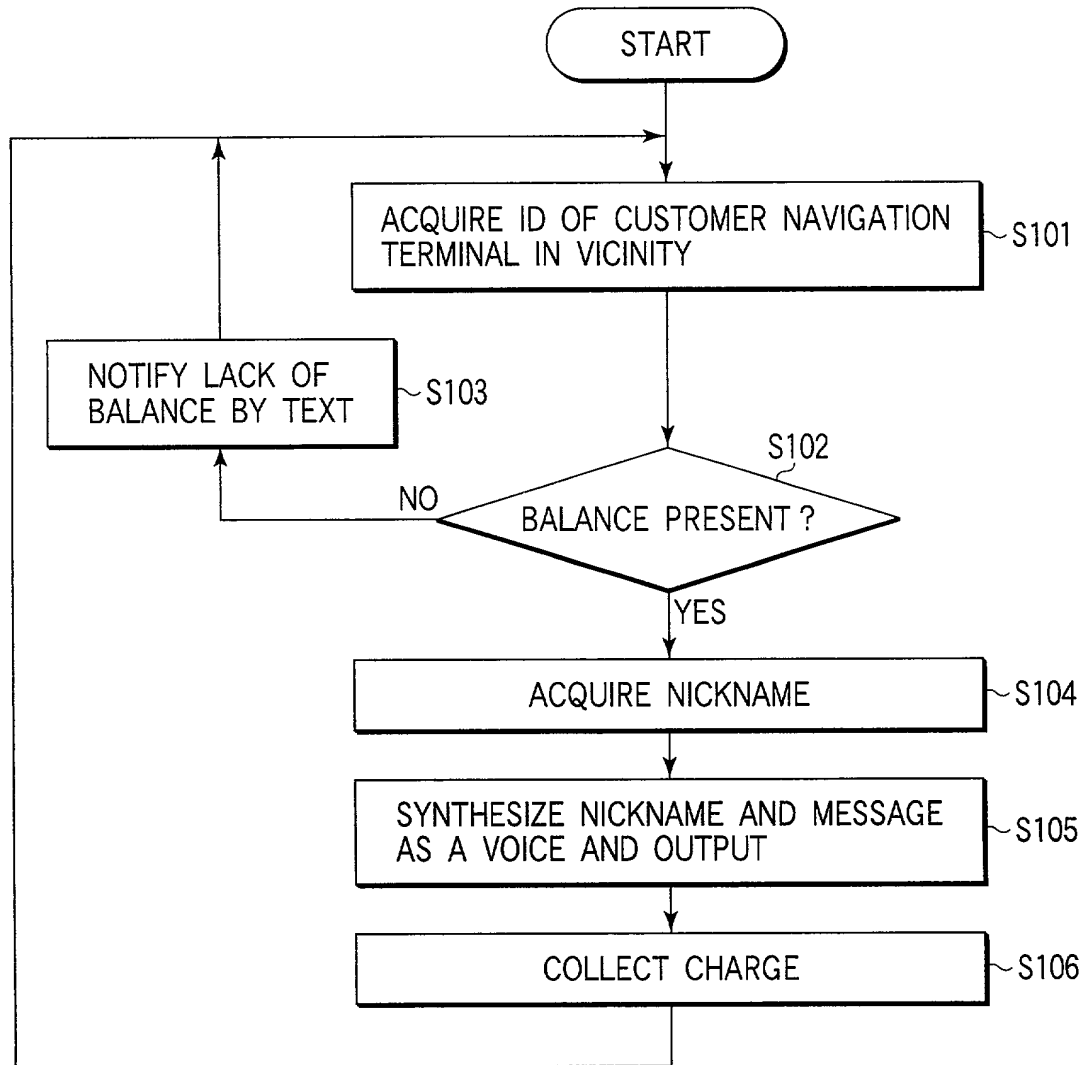


FIG. 3

ITEMS	CONTENTS
NICKNAME	POKEKUN NO. 1
HEIGHT	130
AGE	9
⋮	⋮

FIG. 4A

ITEMS	CONTENTS
NICKNAME	POKEKUN NO. 1
SYNTHESIZED VOICE	VOICE OF POKEKUN
HEIGHT	130
AGE	9
⋮	⋮

FIG. 4B

ITEMS	CONTENTS
NICKNAME	POKEKUN NO. 1
SYNTHESIZED VOICE	VOICE OF POKEKUN
HEIGHT	130
AGE	9
GUARDIAN ID	11
⋮	⋮

FIG. 4C

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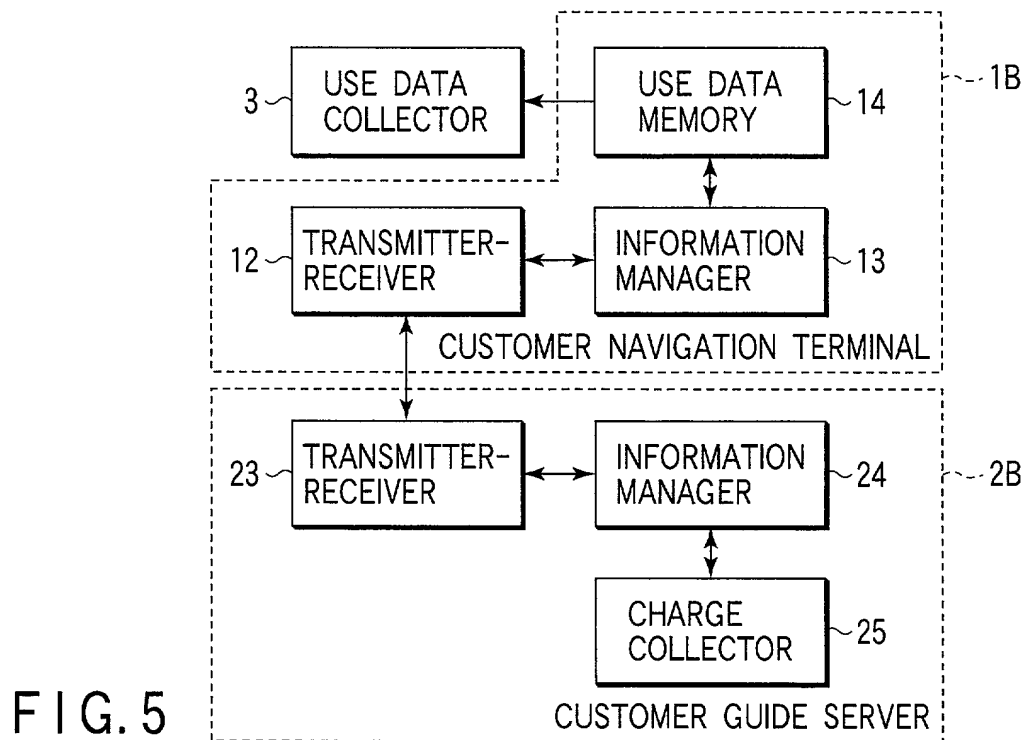


FIG. 5

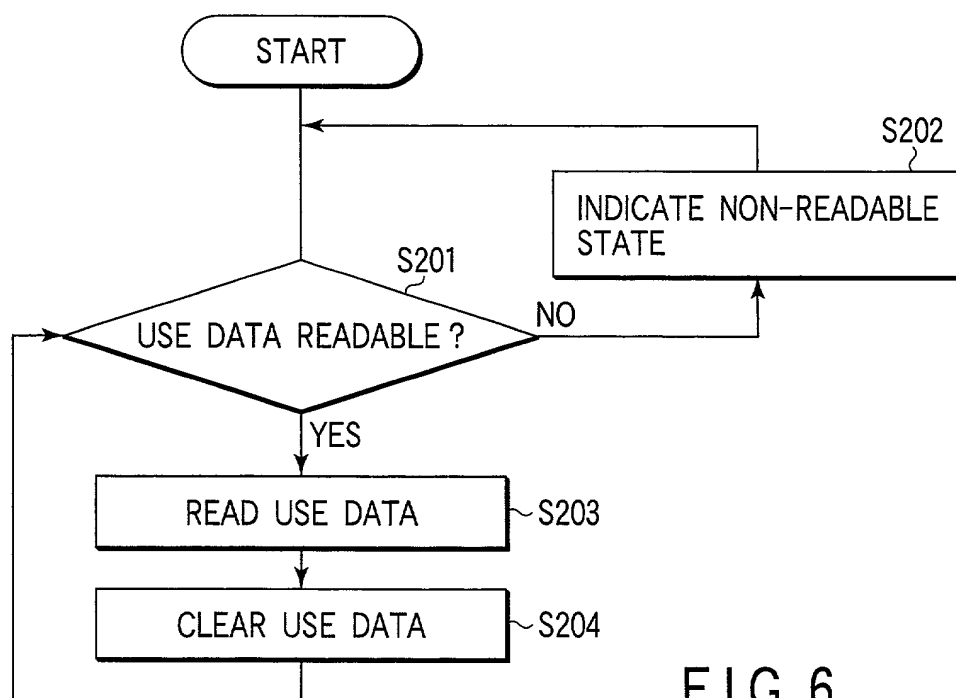


FIG. 6

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ITEMS	CONTENTS	TIMES
NICKNAME	POKEKUN NO.1	99/11/10/9:15
SYNTHESIZED VOICE	VOICE OF POKEKUN	99/11/10/9:15
HEIGHT	130	99/11/10/9:15
AGE	9	99/11/10/9:15
GUARDIAN ID	11	99/11/10/9:15
USE DATA	ATTRACTION A	99/11/10/9:45
	ATTRACTION D	99/11/10/10:45
:	:	

FIG. 7A

ITEMS	CONTENTS	START TIMES	END TIMES
NICKNAME	POKEKUN NO.1	99/11/10/9:15	99/11/10/9:20
SYNTHESIZED VOICE	VOICE OF POKEKUN	99/11/10/9:15	99/11/10/9:20
HEIGHT	130	99/11/10/9:15	99/11/10/9:20
AGE	9	99/11/10/9:15	99/11/10/9:20
GUARDIAN ID	11	99/11/10/9:15	99/11/10/9:20
USE DATA	ATTRACTION A	99/11/10/9:45	99/11/10/10:20
	ATTRACTION D	99/11/10/10:45	99/11/10/11:00
:	:		

FIG. 7B

ITEMS	CONTENTS	WAITING START TIMES	START TIMES	END TIMES
NICKNAME	POKEKUN NO.1	99/11/10/9:00	99/11/10/9:15	99/11/10/9:20
SYNTHESIZED VOICE	VOICE OF POKEKUN	99/11/10/9:00	99/11/10/9:15	99/11/10/9:20
HEIGHT	130	99/11/10/9:00	99/11/10/9:15	99/11/10/9:20
AGE	9	99/11/10/9:00	99/11/10/9:15	99/11/10/9:20
GUARDIAN ID	11	99/11/10/9:00	99/11/10/9:15	99/11/10/9:20
USE DATA	ATTRACTION A	99/11/10/9:25	99/11/10/9:45	99/11/10/10:20
	ATTRACTION D	99/11/10/10:25	99/11/10/10:45	99/11/10/11:00
:	:			

FIG.7C

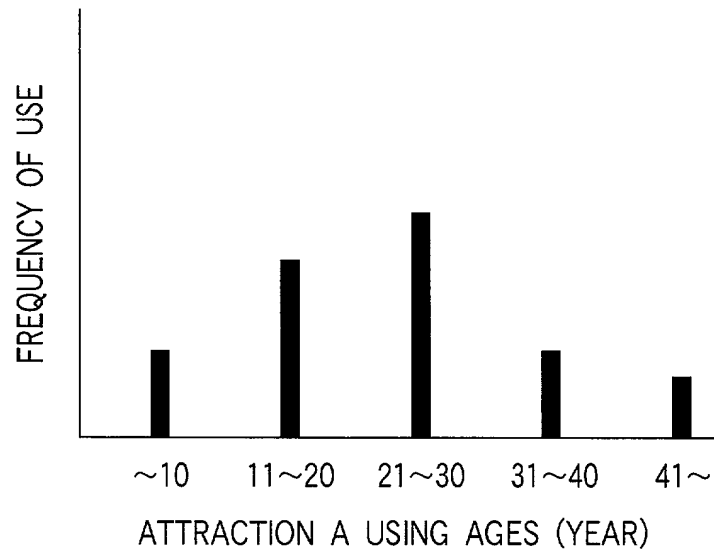


FIG. 8

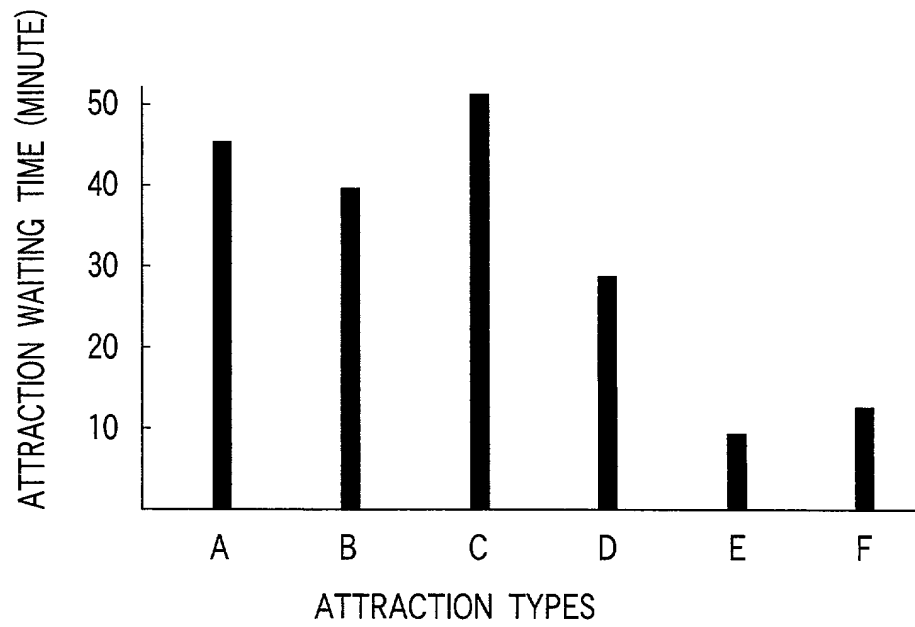


FIG. 9

FIG. 10

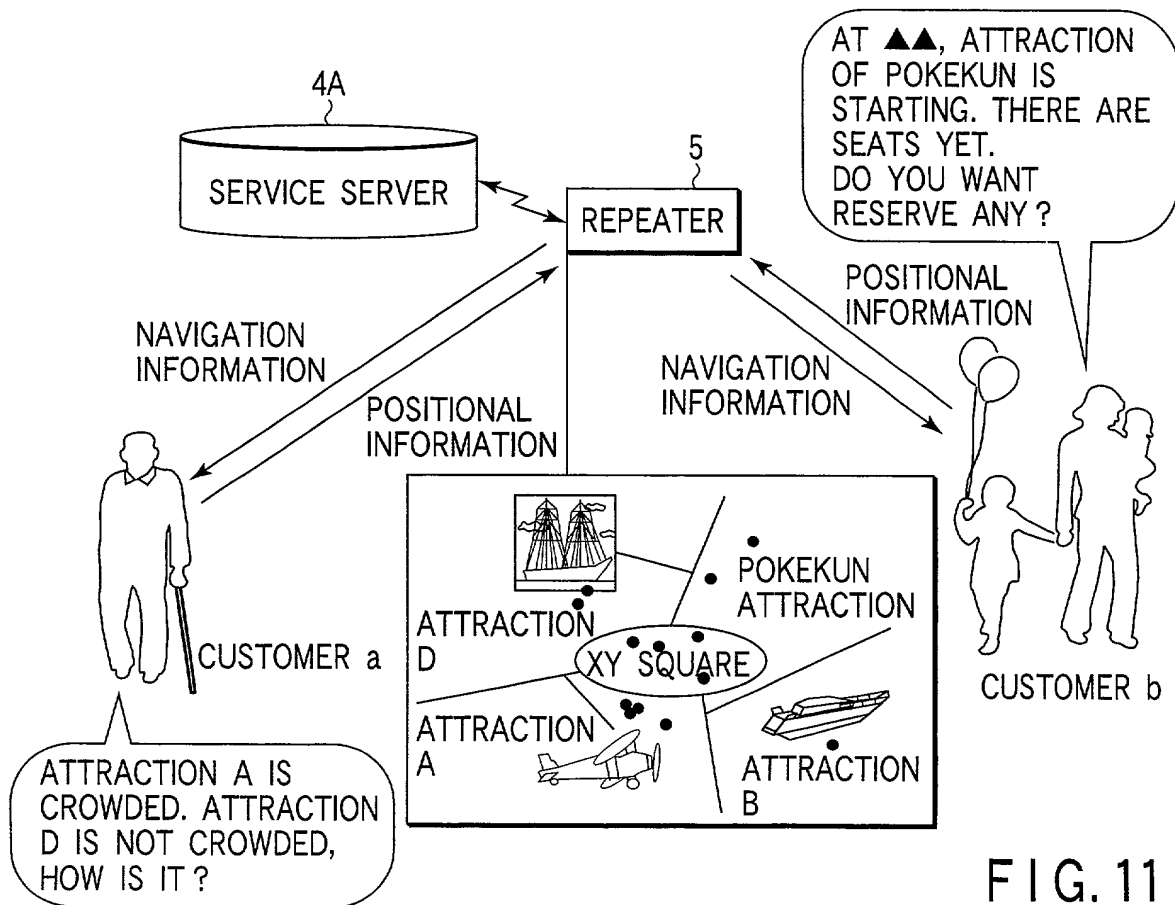
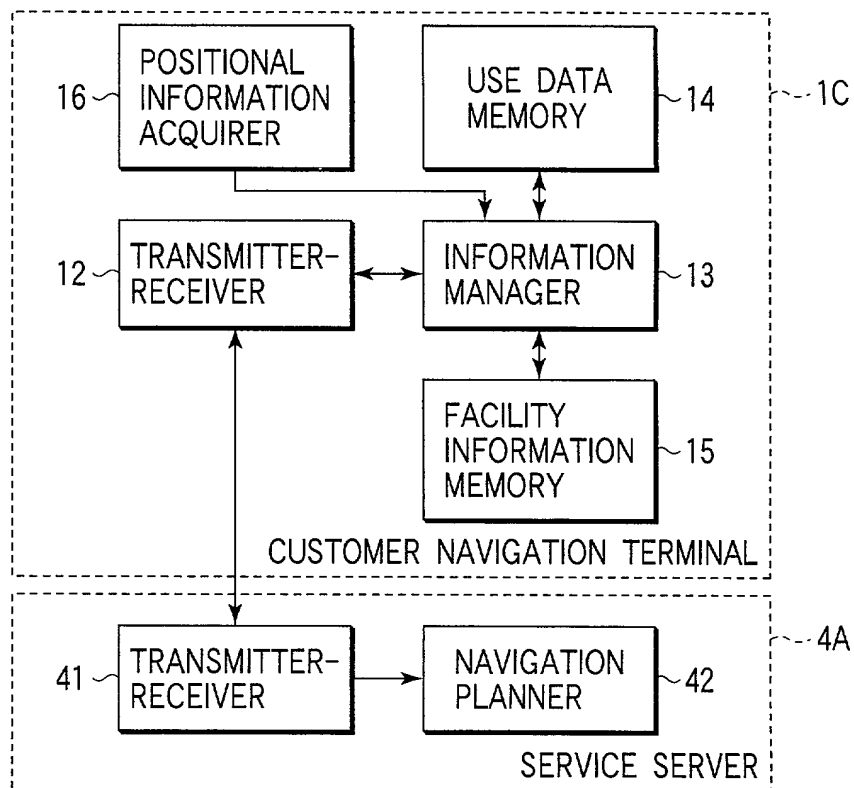


FIG. 11

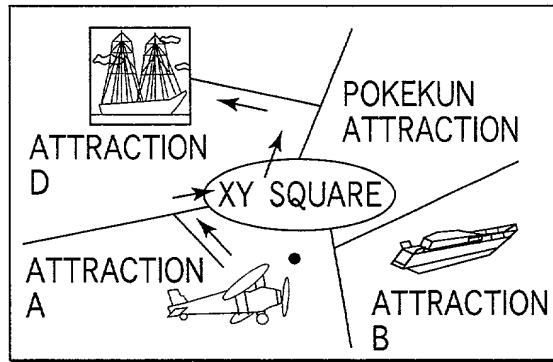


FIG. 12

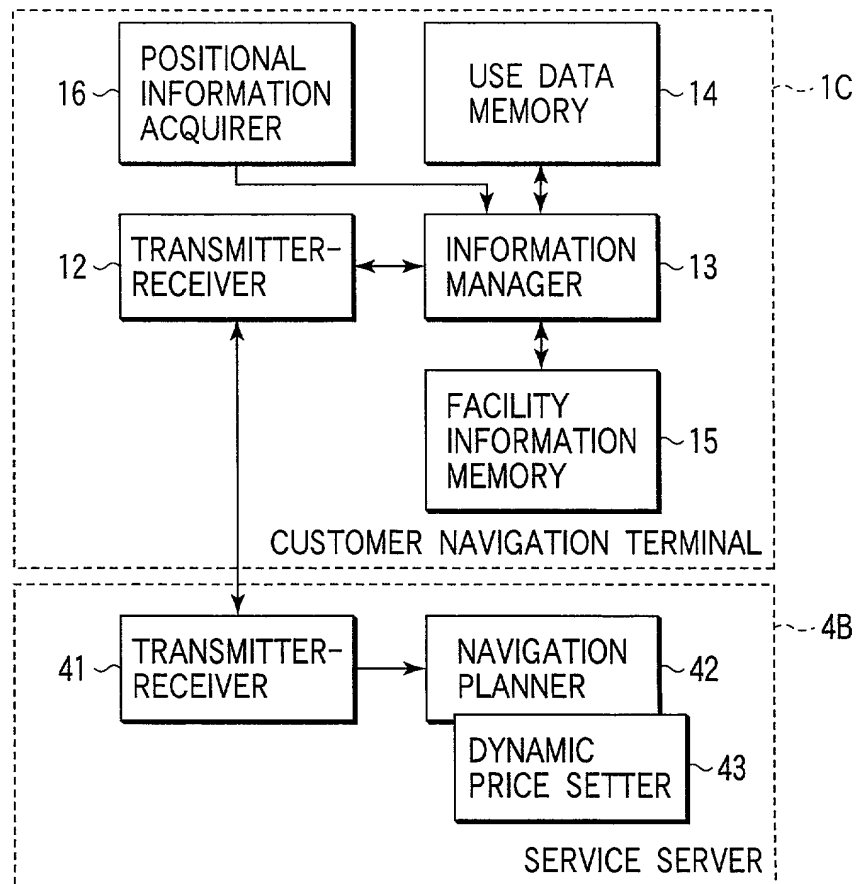
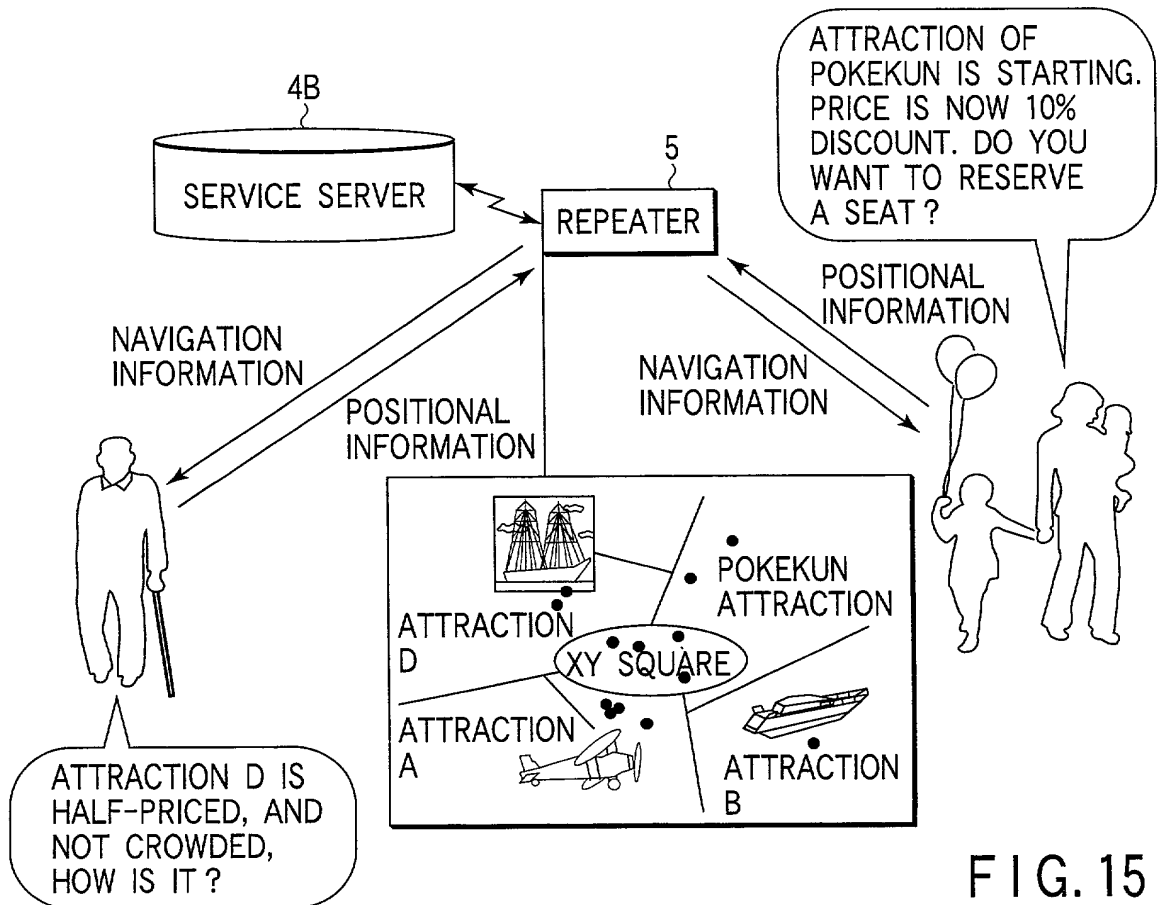
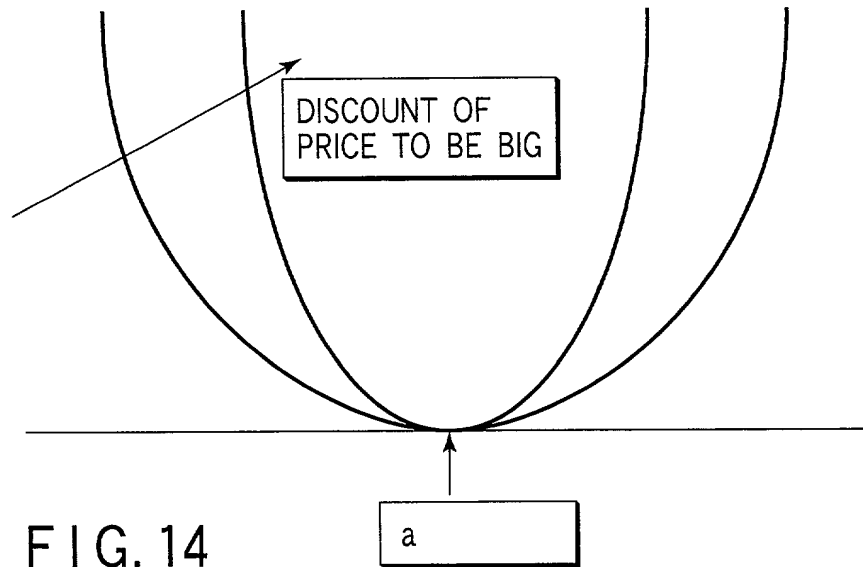


FIG. 13

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## DECLARATION FOR PATENT APPLICATION

As a below named inventor, I declare:

that I verily believe myself to be the original, first and sole (if only one individual inventor is listed below) or an original, first and joint inventor (if more than one individual inventor is listed below) of the invention in

CUSTOMER NAVIGATION SYSTEM AND CUSTOMER NAVIGATION  
METHOD

the specification of which is attached hereto unless the following box is checked.

☐ was filed on \_\_\_\_\_ as United States Application  
or PCT International Application No. \_\_\_\_\_, and  
was amended on \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information of which is material to patentability as defined in 37 CFR 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365 (b) of any foreign application(s) for patent or inventor's certificate, or 35 U.S.C. 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed:

Country	Category	Application No.	Filing Date	Priority Claim
Japan	Patent	11-331972	November 22, 1999	Yes

And I hereby appoint Norman F. Oblon (Reg. No. 24,618), Marvin J. Spivak (Reg. No. 24,913), C. Irvin McClelland (Reg. No. 21,124), Gregory J. Maier (Reg. No. 25,599), Arthur I. Neustadt (Reg. No. 24,854), Richard D. Kelly (Reg. No. 27,757), James D. Hamilton (Reg. No. 28,421), Eckhard H. Kuesters (Reg. No. 28,870), Robert T. Pous (Reg. No. 29,099), Charles L. Gholz (Reg. No. 26,395), Vincent J. Sunderdick (Reg. No. 29,004), William E. Beaumont (Reg. No. 30,996), Robert F. Gnuse (Reg. No. 27,295), Jean-paul Lavalleye (Reg. No. 31,451), Stephen G. Baxter (Reg. No. 32,884), Robert W. Hahl (Reg. No. 33,893), Richard L. Treanor (Reg. No. 36,379), Steven P. Weihrouch (Reg. No. 32,829), John T. Goolkasian (Reg. No. 26,142), Richard L. Chinn (Reg. No. 34,305), Steven E. Lipman (Reg. No. 30,011), Carl E. Schlier (Reg. No. 34,426), James J. Kulbaski (Reg. No. 34,648), Richard A. Neifeld (Reg. No. 35,299), J. Derek Msaon (Reg. No. 35,270), Surinder Sachar (Reg. No. 34,423), Christina M. Gadiano (Reg. No. 37,628), Jeffrey B. McIntyre (Reg. No. 36,867), Paul E. Rauch (Reg. No. 38,591), William T. Enos (Reg. No. 33,128) and Michael E. McCabe, Jr., (Reg. No. 37,182) each of whose address is Fourth Floor, 1755 Jefferson Davis Highway, Arlington, Virginia 22202, or any one of them, my attorneys with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent & Trademark Office connected therewith, and request that correspondence be directed to Oblon, Spivak, McClelland, Maier & Neustadt, P.C., Fourth Floor, 1755 Jefferson Davis Highway, Arlington, Virginia 22202.

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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## DECLARATION FOR PATENT APPLICATION

I declare further that my post office address is at c/o  
Intellectual Property Division, KABUSHIKI KAISHA TOSHIBA, 1-1 Shibaura  
1-chome, Minato-ku, Tokyo 105-8001, Japan; and  
that my citizenship and residence are as stated below next to my name:

Inventor: (Signature)DateResidenceDate: NOV. 14. 2000Miwako Doi

Miwako Doi

Citizen of: JapanKawasaki-shi, JapanDate:Citizen of: JapanDate:Citizen of: JapanDate:Citizen of: JapanDate:Citizen of: JapanDate:Citizen of: JapanDate:Citizen of: JapanDate:Citizen of: Japan